

CLAIMS

What is Claimed is:

1. A chemical mechanical polishing method using a chemical mechanical polishing apparatus comprising a polishing table including a rotation mechanism, a polishing pad
5 attached on the polishing table, a substrate carrier for holding a member to be polished, said substrate carrier including a rotation mechanism and a pressurization mechanism, and a dresser including a rotation mechanism and a pressurization mechanism, said method comprising the steps of:
 - (a) dressing the polishing pad with the dresser coming in contact with the polishing
10 pad; and
 - (b) polishing a film using the polishing pad having a surface roughness of $6\mu\text{m}$ to $8\mu\text{m}$ inclusive in a pattern formation substrate including a substrate region in the top of which a trench is formed and the film with which the trench is filled in.
2. The chemical mechanical polishing method of Claim 1, wherein
15 in the step (a), a dressing pressure of $18\text{g}/\text{cm}^2$ to $40\text{g}/\text{cm}^2$ inclusive is applied to the dresser.
3. The chemical mechanical polishing method of Claim 2, wherein
in the step (a), a dressing pressure of $24\text{g}/\text{cm}^2$ to $34\text{g}/\text{cm}^2$ inclusive is applied to the dresser.
- 20 4. The chemical mechanical polishing method of Claim 1, wherein
the film includes a copper film and a barrier metal, and
in the step (b), the copper film and the barrier metal are polished to form a buried copper interconnect in the top of the substrate region.
5. The chemical mechanical polishing method of Claim 1, wherein
25 the step (a) and the step (b) are carried out simultaneously.
6. A chemical mechanical polishing method using a chemical mechanical polishing apparatus comprising a polishing table including a rotation mechanism, a polishing pad

attached on the polishing table, a substrate carrier for holding a member to be polished, said substrate carrier including a rotation mechanism and a pressurization mechanism, and a dresser including a rotation mechanism and a pressurization mechanism, said method comprising the steps of:

5 (a) bringing the dresser into contact with the polishing pad by applying a dressing pressure of 18g/cm^2 to 40g/cm^2 inclusive to the dresser to dress the polishing pad; and

 (b) polishing a film using the polishing pad in a pattern formation substrate including a substrate region in the top of which a trench is formed and the film with which the trench is filled in.

10 7. The chemical mechanical polishing method of Claim 6, wherein

 in the step (a), a dressing pressure of 24g/cm^2 to 34g/cm^2 inclusive is applied to the dresser.

8. A chemical mechanical polishing apparatus comprising:

 a polishing table including a rotation mechanism;

15 a polishing pad for polishing a member to be polished, said polishing pad being attached on the polishing table;

 a substrate carrier for holding the member to be polished, said substrate carrier including a rotation mechanism and a pressurization mechanism;

 a dresser to make the surface of the polishing pad rough, said dresser including a
20 rotation mechanism and a pressurization mechanism;

 torque measuring means for measuring a rotational torque produced between the dresser and the polishing pad, said torque measuring means being attached to the dresser; and

 a torque monitor for monitoring the rotational torque measured by the torque
25 measuring means.

9. A chemical mechanical polishing apparatus comprising:

 a polishing table including a rotation mechanism;

a polishing pad for polishing a member to be polished, said polishing pad being attached on the polishing table;

a substrate carrier for holding the member to be polished, said substrate carrier including a rotation mechanism and a pressurization mechanism;

5 a dresser to make the surface of the polishing pad rough, said dresser including a rotation mechanism and a pressurization mechanism;

an irradiation device for irradiating the surface of the polishing pad with a laser beam or an electromagnetic wave;

10 a detector for detecting the laser beam or the electromagnetic wave reflected by the surface of the polishing pad; and

a controller for controlling the pressure to be applied to the dresser in accordance with the intensity of the laser beam or the electromagnetic wave detected by the detector.

10. A chemical mechanical polishing apparatus comprising:

a polishing table including a rotation mechanism;

15 a polishing pad for polishing a member to be polished, said polishing pad being attached on the polishing table;

a substrate carrier for holding the member to be polished, said substrate carrier including a rotation mechanism and a pressurization mechanism;

20 a dresser to make the surface of the polishing pad rough, said dresser including a rotation mechanism and a pressurization mechanism;

a transmitter for irradiating the polishing pad with an electromagnetic wave, said transmitter being attached to the dresser;

a receiver for receiving the electromagnetic wave reflected by the polishing pad; and

25 a time measuring device for measuring the time required from when the electromagnetic wave is transmitted from the transmitter to when the electromagnetic wave is received by the receiver, said time measuring device being connected to the receiver.